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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,160	12/31/2003	Hui Chun Hsu	OP-092000367	6964
7590	06/16/2004		EXAMINER	
YI-WEN TSENG #D306 509 ROOSEVELT BLVD. FALL CHURCH, VA 22044			DUONG, THO V	
			ART UNIT	PAPER NUMBER
			3743	

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/748,160	HSU, HUL CHUN
	Examiner	Art Unit
	Tho v Duong	3743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 31 December 2003.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-8 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-8 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 31 December 2003 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \*    c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## **DETAILED ACTION**

### ***Claim Objections***

Claim 1 is objected to because of the following informalities: “a melting points” should be changed into “a melting point”. Appropriate correction is required.

### ***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the claimed subject matter of “a winding coil” is not disclosed in the specification.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed subject matter of “a winding coil” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The

replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 6 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claimed subject matter of "the material for fabricating the support member has the melting point lower than that of the material for fabricating the tubular member" is not adequately described in the specification for one skilled in the art to make the invention since applicant does not describe what material is the support member made of that has a melting point temperature lower than the tubular member and higher than the wick material. The applicant only discloses that both the support member and the tubular member can be fabricated from pure copper. Obviously, if both of the members are made from the same material, they must have the same melting point.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kitazawa et al. (US 6,293,014). Kitazawa discloses (figure 3 and column 4, lines 5-14) a heat pipe (3) comprising a copper tubular member (4) having a support member (6) disposed in the hollow tubular member forming an interior wall of the tube; and a wick structure (5) supported by the support member and attached to the interior wall of the tubular member; wherein the wick member is made of phosphor bronze which has lower melting temperature than the copper of the tube and the support member; the support member (6) including elongated spiral structure extending through the hollow tubular member; the wick structure (5) can be metal wires or metal screen mesh.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,5 and 8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shizuka (JP 357144890A). Shizuka

discloses (figure 6) a heat pipe structure (7) comprising a hollow tubular member (1); a perforated support member (3) disposed in the hollow tubular member; and a wick structure (2) supported by the support member and attached to an interior wall of the tubular member.

Shizuka further discloses that the tubular member is made of Cu, Al, etc; the wick (2) is made of glass fibers, or fibers of Cu, Al, stainless steel, etc; and the support member is made of Cu or Al. As it is known in the art that Copper (Cu) has a melting temperature of about 1984 F (1358K) degrees, Aluminum (Al) has a melting temperature of about 1219 F (933K) degrees and fiberglass has a melting temperature of about 1200 F degrees. As regarding claims 1 and 6, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the wick material as a fiber glass or aluminum, the tubular member material as copper and the support structure as aluminum or copper since these materials have been disclosed by Shizuka. Therefore, the wick structure has a lower melting point than those of tubular member and the support member. The physical property of the materials is found in Table A. 1 on page 827 in the textbook "Fundamentals of Heat and Mass Transfer" 4<sup>th</sup> and Patent number 5,174,849, on column 4, lines 15-18.

Claims 2-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shizuka as obvious in view of Han et al. (US 6,427,765). Shizuka substantially discloses all of applicant's claimed invention as discussed above except for the limitation of the support member including a wire spiral or a winding coil and the wick is in the form of a screen mesh. Han et al. discloses (3a) a heat pipe having an outer pipe (10), a wick (65) attached on an inner surface of the outer pipe and a support structure (68) wherein the support structure includes an elongated wire spiral structure (coiling) extending through the hollow tubular member for the purpose of

improving the securing of the wick on to the outer pipe due to the spring characteristic of the spiral structure of the support member. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Han's teaching in Shizuka's heat pipe for the purpose of improving the securing the wick on to the outer pipe. Han further discloses (figure 2a) that the wick material in form of a screen mesh, which provides a high capillary action, is already available in the industry for use as a wick material in the heat pipe. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Han's teaching in the Shizuka's heat pipe for the purpose of obtaining a high capillary action wick material, which is already available in the heat pipe industry.

Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shizuka as obvious in view of Kazuo et al. (JP 356146989A). Shizuka substantially discloses all of applicant's claimed invention as discussed above except for the limitation that the support structure including wire (coiling) spiral structure. Kazuo discloses (figure 1) a heat pipe having a pipe (1), a wick structure (3) and a support structure (4) wherein the support structure includes a spiral (coiling) wire for the purpose of effectively securing the wick material onto the pipe. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Kazuo's teaching in Shizuka's heat pipe for the purpose of effectively securing the wick on to the pipe.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Noren (US 3,680,189) discloses a heat pipe having a pipe made of pure copper and wick is made of phosphor bronze.

Honda (US 4,109,709) discloses a heat pipe having spiral inner tube.

Lewis et al. (US 4,557,413) discloses a heat pipe fabrication with titanium member and stainless steel wick.

Low et al. (US 3,789,920) discloses a heat pipe having a spiral support structure disposed inside the heat pipe.

Jiyunji et al. (JP 402157596A) discloses a heat pipe having a wick holder coil made of Ti-Ni.

Izumi (JP 355000864A) discloses a spring plate disposed inside the heat pipe.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Tho Duong whose telephone number is (703) 305-0768. The examiner can normally be reached on from 9:30-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennet, can be reached on (703) 308-0101. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.

TD

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June 11, 2004

*Tho Duong*

Tho Duong

Patent Examiner.